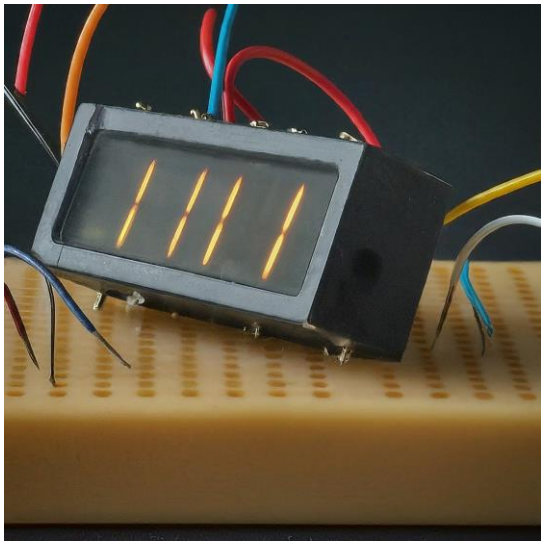
7 Segment Display

Seven-segment displays are used in common household appliances like microwave ovens, washing machines, and air conditioners. They're a simple and effective way to display numerical information like sensor readings, time, or quantities. In this tutorial, we'll see how to set up and program single seven-segment displays on the STM32F0 dev board.



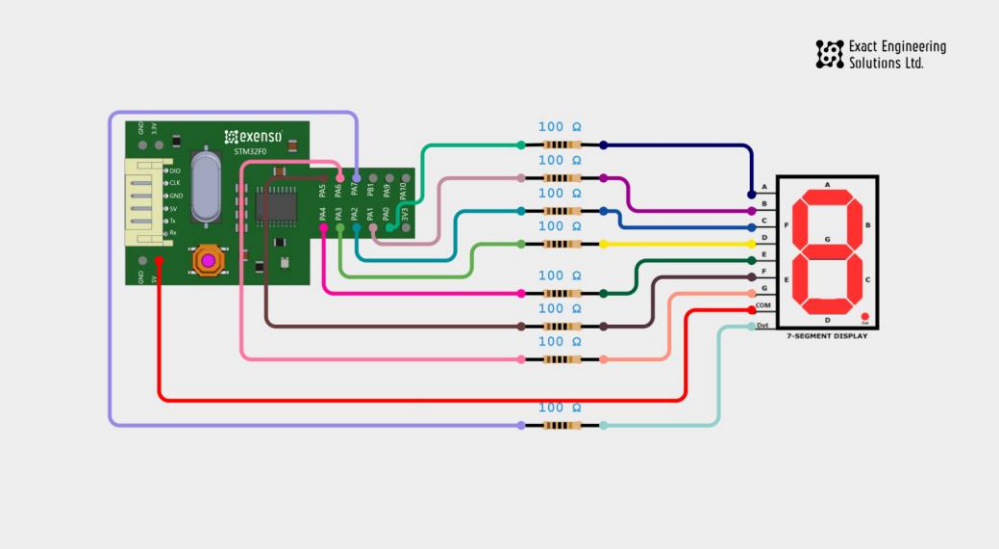
Components Required

You will need the following components −

- 1 × Breadboard
- 1 × STM32F030F4P6
- 1× Single digit Seven Segment display
- 8 × 100Ω Resistor
- Some Jumper wire

Procedure

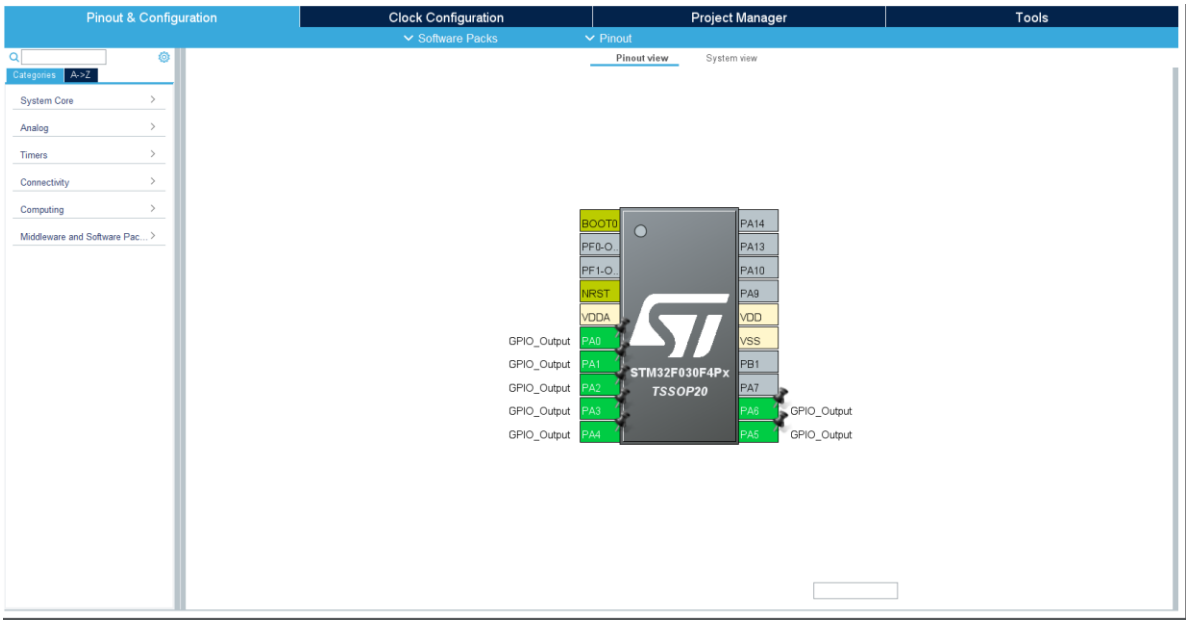
Follow the circuit diagram and hook up the components on the breadboard as shown in the image given below.



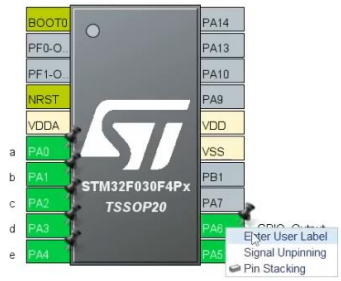
This tutorial uses a 7-segment common anode which means the **com** pin is connected to the Vcc pin and the rest of the pins are connected to GPIOs.These pins led ON when the GPIO output gave low voltage.

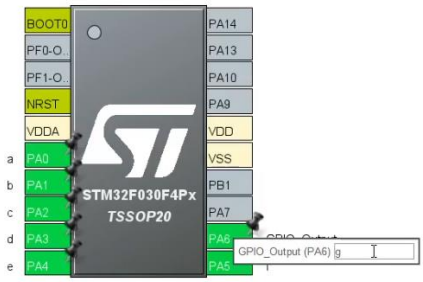
STM32F0 Pin Configuration:

PA0 to PA7 set as an output.

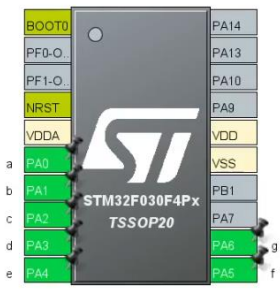


Click the mouse right button on the output pin and label or set the output name.





Hit the keyboard Enter button



CODE

```
#include "main.h"

void SystemClock_Config(void);
static void MX_GPIO_Init(void);

uint8_t seg_table[] = {

      0b11000000,    // 0
      0b11111001,    // 1
      0b10100100,    // 2
      0b10110000,    // 3
      0b10011001,    // 4
      0b10010010,    // 5
      0b10000010,    // 6
      0b11111000,    // 7
      0b10000000,    // 8
      0b10010000     // 9
};

int length = sizeof(seg_table) / sizeof(seg_table[0]);

int main(void)
{
  HAL_Init();

  SystemClock_Config();

  MX_GPIO_Init();
  while (1)
  {

        for (uint8_t count = 0; count <length; count++) {

              GPIOA->ODR = seg_table[count];   //ODR-Output Data Register value

              HAL_Delay(1000);  // Delay 1 second
            }


  }
}
```

```
uint8_t seg_table[] = {

      0b11000000,    // 0
      0b11111001,    // 1
      0b10100100,    // 2
      0b10110000,    // 3
      0b10011001,    // 4
      0b10010010,    // 5
      0b10000010,    // 6
      0b11111000,    // 7
      0b10000000,    // 8
      0b10010000     // 9
};
```

The array **seg_table** holds binary values that represent which segments of the seven-segment display need to be lit to display a specific digit (0-9).

```
        for (uint8_t count = 0; count <length; count++) {

              GPIOA->ODR = seg_table[count];    //ODR-Output Data Register value

              HAL_Delay(1000);  // Delay 1 second
            }
```

This code creates a loop that iterates through the **seg_table**, displaying each digit (0 to 9) on the seven-segment display for one second before moving on to the next digit. This creates a continuous cycling display of all digits.